① Find the reciprocals of each value.

(a) $\frac{2}{3}$ $\frac{3}{2}$ (b) -1 -1 (c) $\frac{1}{3}$ 3 (d) 0 undefined $\frac{0}{1}$ $\frac{1}{0}$

② Divide

(a) $\dfrac{1}{\frac{2}{3}}$ $\frac{3}{2}$ (b) $\dfrac{1}{\frac{1}{3}}$ $\frac{3}{1}$ (c) $\dfrac{1}{\frac{5}{3}}$ $\frac{3}{5}$ (d) $\dfrac{1}{\frac{x}{r}}$ $\frac{r}{x}$

Identity in math is something that is always true

$$(x+y)^2 = x^2 + 2xy + y^2$$

Reciprocal Identities

$$\sin\theta = \frac{1}{\csc\theta} \qquad \csc\theta = \frac{1}{\sin\theta}$$

$$\cos\theta = \frac{1}{\sec\theta} \qquad \sec\theta = \frac{1}{\cos\theta}$$

$$\tan\theta = \frac{1}{\cot\theta} \qquad \cot\theta = \frac{1}{\tan\theta}$$

Find

$\cos\theta$ if $\sec\theta = \frac{5}{3}$ $\cos\theta = \frac{3}{5}$

$\sin\theta$ if $\csc\theta = -\frac{\sqrt{12}}{2}$ $\sin\theta = \frac{-2\sqrt{12}}{12}$

$-\frac{2}{\sqrt{12}} \cdot \frac{\sqrt{12}}{\sqrt{12}} = \frac{-2\sqrt{12}}{12} = -\frac{\sqrt{3}}{3}$ $\frac{1}{2} \neq \frac{1}{4}$

$\frac{-2 \cdot \sqrt{4} \cdot \sqrt{3}}{12} = \frac{-4\sqrt{3}}{12} = -\frac{\sqrt{3}}{3}$

$\tan\theta = -\frac{\sqrt{8}}{2}$

find $\cot\theta$

$$\cot\theta = -\frac{2}{\sqrt{8}} \cdot \frac{\sqrt{8}}{\sqrt{8}} = -\frac{2\sqrt{8}}{8} = -\frac{\sqrt{8}}{4} = -\frac{\sqrt{4}\cdot\sqrt{2}}{4} = \frac{-2\sqrt{2}}{4}$$

$$= -\frac{\sqrt{2}}{2}$$

$\frac{2}{4} = \frac{1}{2}$

Ranges of Trig functions

$-1 \leq \sin\theta \leq 1$

$-1 \leq \cos\theta \leq 1$

$-\infty < \tan\theta < \infty$

All $\mathbb{R}$

$1 \leq \csc\theta$ and $\csc\theta \leq -1$

$1 \leq \sec\theta$ and $\sec\theta \leq -1$

$\cot\theta$ = All $\mathbb{R}$

$\sin\theta = \sqrt{8}$

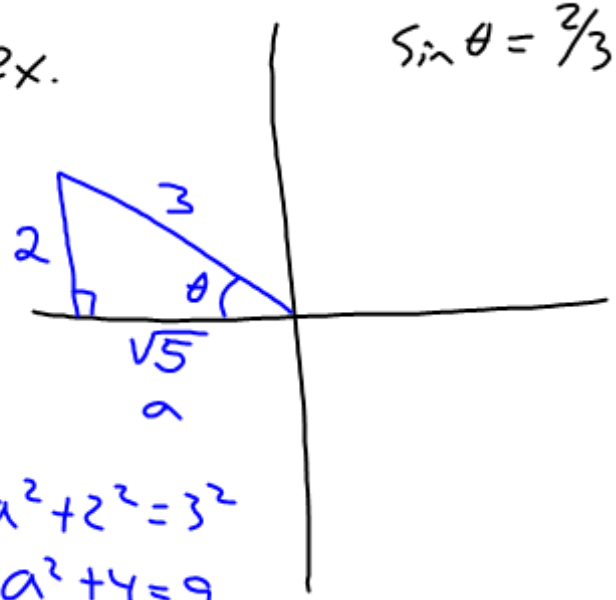
$\tan\theta = -110.7$ ✓

$\sec\theta = 0.6$

Sect. 1.4

1, 5, 6, 7, 12, 13, 21, 24, 55, 56, 64-70

ex. $\sin\theta = 2/3$ in Quad II



$a^2 + 2^2 = 3^2$

$a^2 + 4 = 9$

$a^2 = 5$

$\tan\theta = \frac{1}{\cot\theta}$

same